



IFW

WRA0007-US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

MIKHALTSEVITCH, ET AL.

Serial No.: 10/518,480

Filed: December 20, 2004

For: PULSE SEQUENCES FOR
EXCITING NUCLEAR
QUADRUPOLE RESONANCE

Art Unit: 2862

Examiner: Not Assigned Yet

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants wish to make of record in the above-identified application the document or documents referenced on the attached Form PTO-1449. A copy of each reference (if required) is enclosed herewith.

The undersigned believes that this Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits for the above-referenced application. Accordingly, Applicants do not believe that a fee is due for filing this paper. However, should a first action on the merits have been issued on the same day or before this Information Disclosure Statement is filed, please accept this Information Disclosure Statement under Rule 97(c) and charge the requisite Rule 17(p) fee to our Deposit Account No. 03-3975, under Order No. WRA0007-US and proceed to consider this Information Disclosure Statement.

Serial No.: 10,518,480
Art Unit: 2862

Attorney's Docket No.: WRA0007-US
Page 2

It is respectfully requested that the information be expressly considered during the prosecution of this application, and that each reference be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This submission does not represent that any referenced document is material or constitutes "prior art." If it should be determined that one or more of the referenced documents constitute "prior art" under United States law, Applicants reserve the right to present to the Office the relevant facts and law regarding the appropriate status of the reference or references.

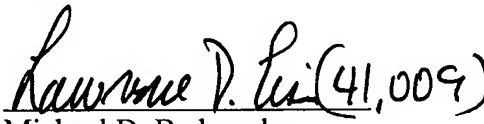
Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over any referenced document, should it be applied against the claims of the present application.

SHAW PITTMAN LLP
1650 Tysons Boulevard
McLean, VA 22102
Tel: (703) 770-7606

Date: February 7, 2006

Respectfully submitted,

MIKHALTSEVITCH, ET AL.

By:  (41,009)
Michael D. Bednarek
Registration No. 32,329

Customer No. 28970

MDB/SPA/ge

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/518,480
		Filing Date	December 20, 2004
		First Named Inventor	MIKHALTSEVITCH, ET AL.
		Art Unit	2862
		Examiner Name	Not Assigned Yet
		Attorney Docket Number	WRA0007-US
Sheet	2	of	4

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
		Flexman, et al., "The Detection of Explosives in Airport Luggage Using the Direct Nuclear Quadrupole Resonance Method," Detection of Bulk Explosives Advanced Techniques Against Terrorism, Proceedings of the NATO Advanced Research Workshop, held in St. Petersburg, Russia, 16-21 June, 2003, Series: NATO Science Series II: Mathematics, Physics and Chemistry, Schubert; Kuznetsov (Eds.) Vol. 138, 2004, p. 113-124	<input type="checkbox"/>
		Garroway, et al., "Explosives Detection by Nuclear Quadrupole Resonance (NQR)," SPIE Vol. 2276, 1994, pp. 139-149	<input type="checkbox"/>
		Garroway, et al., "Narcotics and Explosives Detection by 14N Pure NQR," SPIE Vol. 2092, 1993, pp. 318-327	<input type="checkbox"/>
		Chen and Slichter, "Zero-Field NMR Study on a Spin-Glass: Iron-Doped 2H-Niobium Diselenide," Physical Review B, Vol. 27, No. 1, 1 January 1983, pp. 278-292	<input type="checkbox"/>
		Vega, et al., "Cu Nuclear Quadrupole Resonance of YBa ₂ Cu ₃ O _x With Varying Oxygen Content," Physical Review B, Vol. 39, No. 4, 1 February 1989, pp. 2322-2332	<input type="checkbox"/>
		Kreis, et al., "Low Frequency Pulse Excitation in Zero Field Magnetic Resonance," J. Chem. Phys., Vol. 89, No. 11, 1988, pp. 6623-6635	<input type="checkbox"/>
		Erickson, "Optically Detected Multipulse Nuclear-Quadrupole-Resonance Studies of Trivalent Praseodymium in Zero and Weak Static Magnetic Fields," Physical Review B, Vol. 39, No. 10, 1 April 1989, pp. 6342-6347	<input type="checkbox"/>
		Singh and Armstrong, "Spin Thermodynamics Applied to Pure Nuclear Quadrupole Resonance for an Inhomogeneously Broadband Line in a Spin-3/2 System," Journal of Physics C: Solid State Physics, Vol. 19, 1986, pp. L221-L227	<input type="checkbox"/>
		Bai, et al., "Zeeman-Perturbed Spin-Echo FT NQR Spectroscopy," Journal of Magnetic Resonance Series A, Vol. 102, 1993, pp. 137-143	<input type="checkbox"/>
Examiner Signature			Date Considered

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/518,480
		Filing Date	December 20, 2004
		First Named Inventor	MIKHALTSEVITCH, ET AL.
		Art Unit	2862
		Examiner Name	Not Assigned Yet
		Attorney Docket Number	WRA0007-US
Sheet	3	of	4

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		Shastri, et al., "Distribution of Nonequivalent Aluminum Sites Revealed in Al-Cu-Ru and Al-Cu-Fe Quasicrystals by ²⁷ Al NQR," Physical Review B, Vol. 50, No. 6, 1 August 1994, pp. 4224-4227	<input type="checkbox"/>
		Nickel and Kimmich, "2D Exchange NQR Spectroscopy," Journal of Molecular Structure, Vol. 345, 1995, pp. 253-264	<input type="checkbox"/>
		Kohori, et al., " ²⁷ Al NMR and NQR Studies of the Antiferromagnetic Superconductor UPd ₂ Al ₃ ," Solid State Communications, Vol. 95, No. 2, 1995, pp. 121-126	<input type="checkbox"/>
		Peterson and Oja, "A Pulsed Nuclear Quadrupole Resonance Spectrometer," Advances in Nuclear Quadrupole Resonance, Vol. 1, ed. J.A.S. Smith (London: Heyden), 1974, pp. 179-184	<input type="checkbox"/>
		Ramachandran and Narasimhan, "A Coherent Nuclear Quadrupole Pulse and Double Resonance Spectrometer," Journal of Physics E: Scientific Instruments, Vol. 16, 1983, pp. 643-648	<input type="checkbox"/>
		Harding, et al., "A Pulsed NQR-FFT Spectrometer for Nitrogen-14," Journal of Magnetic Resonance, Vol. 36, 1979, pp. 21-33	<input type="checkbox"/>
		Hirschfeld and Klainer, "Short Range Remote NQR Measurements," Journal of Molecular Structure, Vol. 58, 1980, pp. 63-77	<input type="checkbox"/>
		Grechishkin, "NQR Device for Detecting Plastic Explosives, Mines and Drugs," Applied Physics A, Vol. 55, 1992, pp. 505-507	<input type="checkbox"/>
		Grechishkin and Sinyavskii, "Remote Nuclear Quadrupole Resonance in Solids," Physics, Uspekhi, Vol. 38, No. 10, 1993, pp. 980-1003	<input type="checkbox"/>
		Grechishkin, "Application of Multipulse Sequences in Remote NQR," Applied Physics A, Vol. 58, 1994, pp. 63-65	<input type="checkbox"/>
		Klainer, et al., "Fourier Transform Nuclear Quadrupole Resonance Spectroscopy," in "Fourier, Hadamard and Hilbert Transforms in Chemistry," A.G. Marshall, Ed. Plenum, New York, 1982, pp. 147-182	<input type="checkbox"/>

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/518,480
		Filing Date	December 20, 2004
		First Named Inventor	MIKHALTSEVITCH, ET AL.
		Art Unit	2862
		Examiner Name	Not Assigned Yet
Sheet 4	of 4	Attorney Docket Number	WRA0007-US

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		Maricq, "Quasistationary State and its Decay to Equilibrium in the Pulsed Spin Locking of a Nuclear Quadrupole Resonance," Physical Review B, Vol. 33, No. 7, 1 April 1986, pp. 4501-4513	<input type="checkbox"/>
		Alexander and Tzalmona, "Relaxation by Slow Motional Processes. Effect of Molecular Rotations in Pure Quadrupole Resonance," Physical Review, Vol. 138, No. 3A, 3 May 1965, pp. A845-A855	<input type="checkbox"/>
		Carr, "Steady-State Free Precession of Nuclear Magnetic Resonance," Physical Review, Vol. 112, No. 5, 1 December 1958, pp. 1693-1701	<input type="checkbox"/>
		Osokin, et al., "The Quasistationary States in Multipulse NQR," Z. Naturforsch, Vol. 47A, 1992, pp. 439-445	<input type="checkbox"/>
		Osokin and Shagalov, "NQR Transient Nutation and Rotary Echoes in the Effective Field of Multiple-Pulse Sequences," Solid State Nuclear Magnetic Resonance, Vol. 10, 1997, pp. 63-72	<input type="checkbox"/>
		Liao and Zax, "Analysis of Signal-to-Noise Ratios for Noise Excitation of Quadrupole Nuclear Spins in Zero Field," Journal of Physical Chemistry, Vol. 100, No. 5, 1996, pp. 1483-1487	<input type="checkbox"/>
		Marino and Klainer, "Multiple Spin Echoes in Pure Quadrupole Resonance," The Journal of Chemical Physics, Vol. 67, No. 7, 1 October 1997, pp. 3388-3389	<input type="checkbox"/>
		Hitrin, et al., Pulsed Spin Locking Theory in Pure Quadrupole Resonance," Vol. 83, 1982, pp. 269-275	<input type="checkbox"/>
		Zussman, "Effect of Molecular Reorientation in Urea on the ¹⁴ N PNQR Linewidth and Relaxation Time," The Journal of Chemical Physics, Vol. 58, No. 4, 15 February 1973, pp. 1514-1522	<input type="checkbox"/>
		Bradford, et al., "A Steady-State Transient Technique in Nuclear Induction," Physical Review, Vol. 84, No. 1, 1951, pp. 157-158	<input type="checkbox"/>
			<input type="checkbox"/>

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.